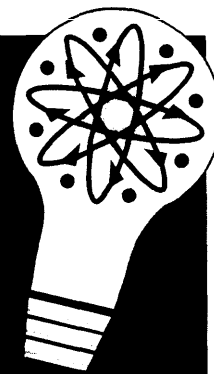


TECHNOLOGY BULLETIN



26 April 1996

TECHCONNECT 1-800-203-6451

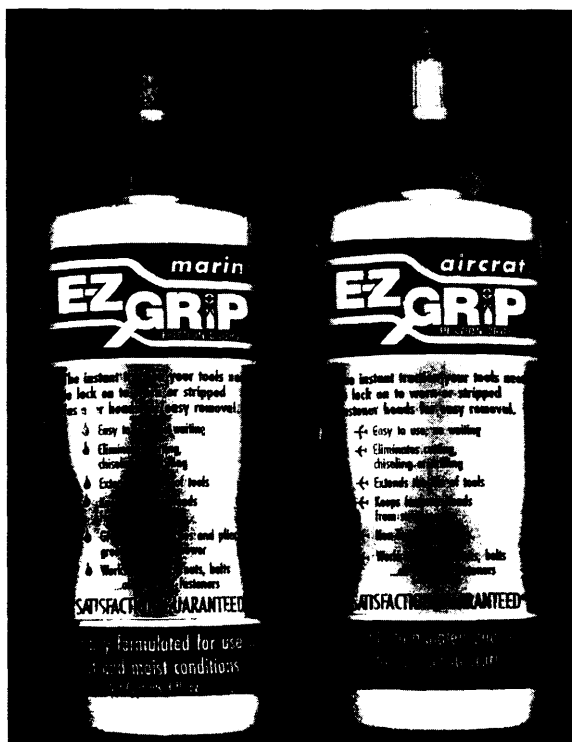
Issue: 26

Gripping Force Multiplier for Tools

TB0064

Liquid increases the gripping power to remove stripped fasteners and nuts.

Removing a stripped fastener or nut is a difficult, costly, and time-consuming task. E-Z Grip™ Friction Drops, a product of Shoreline Industries, Incorporated, Crestline, OH, increases a tool's gripping friction capacity allowing the removal of all types of damaged screws, nuts, and bolts. The drops, composed of food-grade propylene glycol, metallic particles, and thickeners, are applied to the head of a tool or damaged fastener or nut before attempting extraction. The drops increase the tool's bite allowing the nut or fastener to be turned. To use the drops, shake the bottle well and apply a few drops directly to the damaged nut, fastener, or apex of the tool itself. Once the drops are applied, gently place the



tool over or in the fastener or nut, and then exert pressure and turning force.

Because of their controlled structure, the particles align themselves in such a way that, during the application of pressure, they form a new gripping surface for the tool. When the pressure is released, the particles go back into suspension in the liquid. The drops are environmentally safe, do not corrode metal, and do not act as a release agent.

Aviation and marine formulas are available. The aviation formula is designed for use in dry environments, while the marine formula is designed for a moist or wet environment. The aircraft formula's National Stock Number is 6850-01-418-8759 and the marine formula's number is 6850-01-420-9041. E-Z Grip is sold in 4.5-ounce bottles packed 12 bottles per box, which sells for \$273, including shipping. The price per box decreases as the number of boxes purchased increases.



Point of Contact...

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Grip Sockets

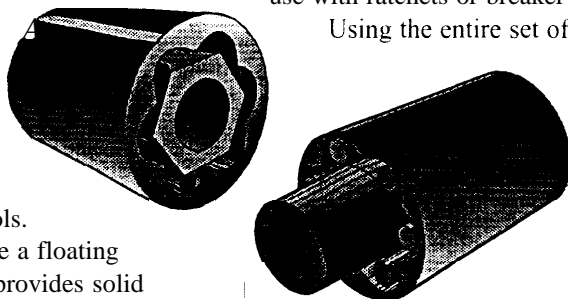
TB0065
Removes nuts and bolts that cannot be gripped by other means.

A CI/Lubesco, Aviation Consumables, Incorporated, Cincinnati, OH, designed and manufactured a set of sockets specifically made to grip nuts that have been damaged or rounded to the point they can no longer be gripped by conventional tools.

The sockets have a floating pin design that provides solid contact to the nut allowing the socket to grip firmly. The sockets have replaceable hardened steel pins and retaining inserts. They have been

tested using a 3/8-inch drive tool at over 300 foot/pounds and using a 1/2-inch drive tool at over 600 foot/pounds. They are recommended for use with ratchets or breaker bars.

Using the entire set of 14 Grip



Sockets, the user can grip any nut from 1/4 inch to 13/16 inch. The sockets come in a carrying case with

cut outs for each. The sockets can be used to remove lug nuts, exhaust manifolds, engine studs, and any other rusted or rounded nut or bolt.

The Grip Socket Tool Kit costs \$179 retail, and ACI/Lubesco is applying for a National Stock Number for the kit.

Point of Contact...

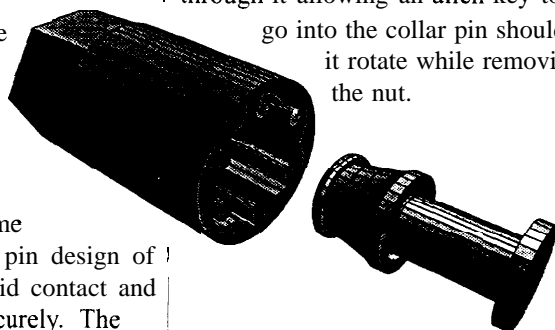
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AVi-Tool Kit

TB0066
Fast and Easy "Hi-Lok Collar" Removal System.

A CI/Lubesco, Aviation Consumables, Incorporated, Cincinnati, OH, developed a new socket kit that removes Hi-Lok collars. The AVi-Tool Kit contains seven sockets to fit numbers 5, 6, 8, 10, 12, 14, and 16 collars and comes with a carrying case and lifetime warranty. The floating pin design of the socket provides solid contact and grips the collar head securely. The

secure grip allows the user to apply less torque to remove the nut. The socket also has a hole completely through it allowing an allen key to go into the collar pin should it rotate while removing the nut.

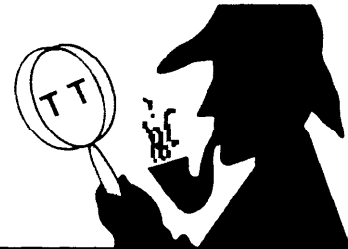


The AVi-Tool Kit costs \$289 retail, and the company is in the process of getting a National Stock Number.

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J-MASS (Joint Modeling and Simulation System)

Open systems architecture for the development, execution, and post-processing of simulations

Synopsis

As Department of Defense (DOD) budgets shrink, computer modeling and simulation will become more common through all phases of acquisition. Current estimates show that DOD spends \$1 billion per year on digital modeling. This amount will expand in the future, even as other budgets decrease. To comply with emerging DOD standard test processes, all ongoing modeling and simulation programs will be reviewed for the feasibility to adopt a common, high-level, simulation system. The goal of this architecture is interoperability. Interoperability allows software programs, regardless of origin, to work together using a standard suite of tools.

Headquarters Air Force Test and Evaluation Office (HQ AF/TE) issued an "Electronic Warfare Test Concept" as a method for reducing the cost of modeling and simulation during acquisition testing. The concept calls for a common software architecture allowing reuse of models and providing a standard to compare results. The Joint Modeling and Simulation System (J-MASS) program is designed as an Open Systems Architecture to support the Air Force's common modeling and simulation architecture needs. It is being developed by the J-MASS System Program Office (SPO), ASC/XRJ, at Wright-Patterson Air Force Base, OH. J-MASS exploits the

technologies of reuse, object-oriented software development, and visual programming to reduce the cost of modeling and simulation. It will serve as a framework or backplane to which other processes can be connected. Ultimately this method will reduce the cost of weapon system development and ensure consistent and credible results analysis.



This simulation system allows aircraft hardware developers to model their designs and test them against specifications during the development cycle. J-MASS provides tools that support the five main activities of the modeling and simulation concept. Using J-MASS, a hardware engineer can develop components, assemble players, configure and execute simulations, and process results with minimal support from a software engineer to make the model work. J-MASS also provides an object-oriented modeling library as the

foundation for these tools and captures the specifications, designs, plans, test and evaluation data, and other information generated during the weapon system acquisition process. The Modeling and Simulation Reuse Library (MSRL) supports the J-MASS community by promoting software reuse and allowing users to download files into the local site's modeling library.

J-MASS's object-oriented design tool, the Model Component Development Tool (MCDT), makes it possible to model a real-world object or modify an existing model using visual programming. The developer uses this feature to develop and maintain model components. The use of J-MASS code generator ensures that the proper interfaces to other portions of the system are automatically achieved.

The Assemble Players mode permits the model developer to assemble components for a simulation by browsing a library of previously developed models. The developer can then assemble the components into players that can be positioned and configured to create a required scenario.

The Configure Simulation mode gives the user a set of visual programming tools to define and configure data for a simulation. It also provides the ability to configure scenario data and components, players, weapon systems, and environment for the simulation.

The experiment manager feature allows the user to set up a series of simulation runs while controlling initial conditions and allows study of the model's performance.

J-MASS allows the user to execute previously created simulations through its Execute Simulation mode. A model can control its own conditions, such as the altitude, speed, or position as synchronized events are being executed. The execute mode also has a data-journaling capability to record data during the simulation. Users can represent user-selected data graphically in two- and three-dimensional formats. There is also a visual playback capability giving simulation results in animated, three-dimensional, visual presentation.

J-MASS includes access to the MSRL located at the SPO as a repository for user-developed modeling components. Users can download unclassified reusable software components and documentation to their location. Pointers will be available to direct users to specific points of contact to receive classified models. Importing components or models is done through an Internet or dial-in service at the SPO.

Benefits/Drawback

J-MASS provides a tool set that implements a single thread of functionality throughout the five

modeling and simulation activities. Users can customize their installations with commercial tools that conform to the J-MASS standards. J-MASS users can reduce modeling and simulation costs by reusing components/models available in the MSRL.

J-MASS also serves as a government off-the-shelf framework for third-party applications. Models have been or are currently being developed by the Missile and Space Intelligence Center (MSIC), National Aerospace Intelligence Center (NAIC), Aeronautical Systems Center (ASC), and Wright Laboratory Armament Directorates (WL/AA and WL/MN) for use with J-MASS. These models represent missiles, aircraft, and multispectral sensors. Some models are of specific weapon systems while some are generic in nature using system-specific data. Models, data, and tools can be shared throughout the J-MASS community.

Applications

Currently, J-MASS will be used in the B-1 B's Defensive System Upgrade Program (DSUP) to model the effectiveness of the electronic warfare components against known threats and their interaction with other systems on the B-1 B. The B-1 B SPO will be responsible for building models representing the B-1 B aircraft and the proposed defensive system. In response to the Electronic Warfare

Test Concept, all the models developed for the program will be compatible with J-MASS architecture. The first phase of the upgrade program is scheduled to begin in June 1996.

The J-MASS concept can apply to any modeling process to reduce the cost of simulation. As the model library becomes populated with models, it will be a valuable asset for reducing cost and decreasing the time required to bring a product from the drawing board to "rubber-on-the-ramp."


Documentation

DOD Directive 5000.59, "DOD Modeling and Simulation Management" HQ AF/TE Electronic Warfare Test Concept

A Technical Overview of the J-MASS Architecture and A New Way for DOD To Do Business: The J-MASS Marketplace distributed by the J-MASS Program Office.

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